Exclusive

Nobel Prize Winner Linus Pauling Answers Teller's Plea in Life for Nuclear Testing, Pages 2-3

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Blessed Are the Peacemakers, But Not in Washington, D.C.

The circumstances surrounding the latest Eisenhower letter to Bulganin interest us as much as the content. Mr. Eisenhower was down in Thomasville, Ga., at the time, fretting in weather too cold for golf or quail shooting, with nothing to do but play bridge. Usually, when the President is away on one of his vacations, Jim Hagerty gives out as much official news as possible from the vacation point, perhaps to demonstrate that Mr. Eisenhower is really hard at work. Hagerty had hoped to release the text of the letter to Bulganin from Thomasville but a White House courier bringing the text was grounded by the storm and the letter had to be given out in Washington. Apparently there was no copy of the final draft in Thomasville or even an earlier version which could be revised by telephone. The incident suggests that Mr. Eisenhower was not kept in such close touch with the drafting of the letter he signed as to interrupt many bridge games. It speaks for the efficiency of this Administration that so important a Presidential letter can be composed without disturbing the Chief Executive.

No Dismissals for Warmongering

We wonder whether Mr. Eisenhower was as remote from the drafting of the letter released two days earlier which sped the departing Stassen from the government. That letter and its circumstances cast an ironic shadow over the one to Bulganin. Mr. Eisenhower indignantly rejected Bulganin's suggestion that there are "imperialist ruling circles" in this country "supposedly eager to plunge the world into war in order to make financial gains." Nobody in Washington or "Wall Street" is crazy enough to want world war. Current research is bent on finding some way to limit war, i.e. to wage it at a distance from which generals can return to collect their decorations while investors clip their coupons with a minimum of radioactive fallout. But while it is difficult to find anyone who wants a new world war, it is also impossible —with Stassen gone—to find any important figure here really intent on peace. Any number of Generals and Admirals in this city have been guilty of incendiary statements, boasting of how many cities in Russia we can level in just how many minutes flat but none of them has ever opened the morning mail to find in it a letter informing him of how deeply the White House regrets his resignation. Nor has Sherman Adams ever held a private dinner for select newsmen to leak the information that Admiral so-and-so's warmongering grates on the Administration's nerves and he will be dismissed if he does not take the hint and retire.

It is instructive to compare the letter bidding Stassen a carefully worded farewell with the letter three years ago in which the President appointed him—as the press was then encouraged to call it—his "Secretary of Peace." That letter was released March 19, 1955, with fanfare. Mr. Stassen was to occupy a newly created Cabinet level post, that of Special Assistant to the President on Disarmament. The President wrote that he had been persuaded to create the post by "the unprecedented destructive power of new weapons and the international tensions which powerful armaments aggravate."

There was no echo of these forgotten phrases in the letter three years later extinguishing this position. In his letter of resignation, Stassen spoke of his disarmament hopes and referred to "the tasks of peace." But it was only on "the more personal side" that Mr. Eisenhower expressed appreciation for Stassen's "readiness to express to me frankly your views on the many subjects that have been of common interest to us both." Neither disarmament nor peace were mentioned, and the historian with no other data than the President's reply will be hard put to determine whether Stassen was on the Civil Aeronautics Board or the Battle Monuments Commission. In a capital where corruptionists mobilize defenders in battalions, Mr. Stassen existed three years as if in a jungle. The State Department's journalistic flunkies pursued him with venom. On every side there was a herd-like hate for the one man trying to do something about the arms race. Mr. Stassen was constantly humiliated and slowly demoted. Perhaps nothing hurt him so much as a reputation for being able to get along with the Russians, a misfortune in a capital where the dirtiest word is co-existence. His career is commentary on Mr. Eisenhower's protestations of our purely peaceful intent.

Ike Would Also Be Amazed If He Read the N. Y. Times

"I am really amazed now to be told by Soviet leaders, who have never even been near this country, that there are in the United States those who in your words, 'utter the dangerous call for preventive war. . . .' "

—The President's letter to Bulganin, Feb. 15.

"Thus the Soviet's slight advantage in the development of long-range missiles does decrease her risks and increase ours. It is for this reason that the old talk of preventive war — made sweeter by another name, 'preventive retaliation'—(to attack the Soviet first) has been heard again, though in muted tones, in Washington, since the launching of the Soviet satellites."

—Hanson W. Baldwin, New York Times, Feb. 4, third in a series on the U. S. military situation.

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An Exclusive: Nobel Prize Winner Linus Pauling Answers Edward Teller's . . .

By Dr. Linus Pauling

The article on "The Compelling Need for Nuclear Tests" by Drs. Edward Teller and Albert Latter in *Life*, Feb. 10 contains serious false statements and misleading statements, unworthy of a scientist with the great cleverness and long experience of Dr. Teller, who can hardly have been unaware of their nature.

For example, the second sentence of the article reads "The petition [to the UN from 9235 scientists of 44 nations, including 36 Nobel Laureates and many others of the most distinguished scientists in the world] said that the tests were endangering both the present population of the world and generations yet unborn and declared that an agreement to stop the testing is now feasible." In the next paragraph the authors say about this statement and a statement about clean bombs (which is not in the petition) that "These statements are not true. The statements are at best half-truths and they are misleading and dangerous."

An Unethical Distortion

But in fact the petition did not say that the tests are endangering the present population and generations yet unborn. The statement by Drs. Teller and Latter is absolutely false. It is of course a clever technique, though unethical, to attribute to your opponent an untrue statement that he has not made and then to devastate this untrue statement. I am shocked that two scientists, Drs. Teller and Latter, should in this way have demeaned themselves to the level of the unscrupulous politician.

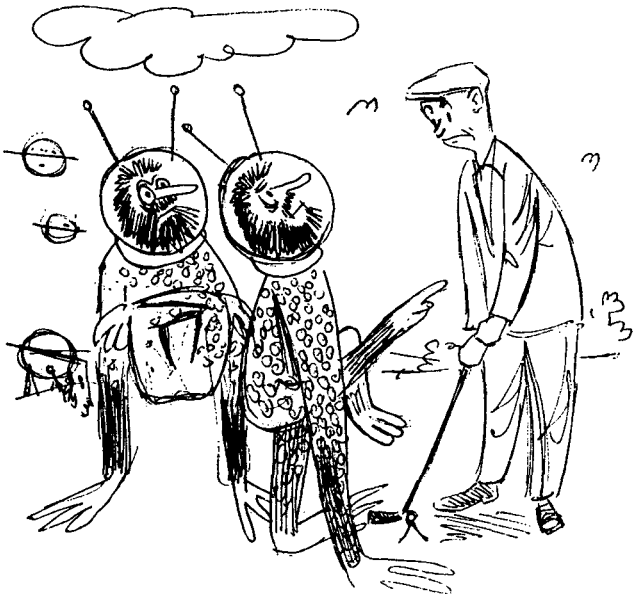
Life did not publish 247 words of the scientists' petition to the UN—this short text could not be fitted into the 5000-word article. [The text was published in this *Weekly*, Jan. 20—IFS]. The million of readers of *Life* were not made aware that the statement in the article that "the petition said that the tests were endangering both the present population of the world and generations yet unborn" is an untrue statement. In fact, the petition says "Each nuclear bomb test spreads an added burden of radioactive elements over every part of the world. Each added amount of radiation causes damage to the health of human beings all over the world and causes damage to the pool of human germ plasm such as to lead to an increase in the number of seriously defective children that will be born in future generations."

The tests themselves do damage to the health of human beings and the pool of human germ plasm, as Drs. Teller and Latter know. The tests cause an increase in the amount of human suffering; but at the present rate of testing they do not endanger the world. It is a great nuclear war that would endanger the world, and would be a catastrophe to all humanity.

Must Be Read With Caution

The tone of the article by Drs. Teller and Latter is set by their second sentence. Every sentence in it must be read carefully and interpreted with caution. For example, in the subheading of the article it is stated that "Fallout risk is overrated," and a reader of the article may be given the impression that fallout risk has really been overrated. He would have this impression because Drs. Teller and Latter give only comparative figures—they talk for example about the small percentage increase in the number of births of defective children, but do not give any estimate of the actual number of defective children that may be expected to result from the bomb tests.

Let me discuss the estimates that have been made of the genetic damage from the nuclear tests. At the present time 75 million children are born in the world each year. About 2 percent of them, 1,500,000 per year, are seriously defective because of bad heredity. The bad genes that they have inherited from their parents cause these children to have serious mental deficiency, or a serious hereditary disease such as cystic fibrosis of the pancreas or muscular dystrophy or hemophilia, or serious malformation, such as achondroplasia (dwarfism) or missing limbs or organs.



—*Frank X. Boyle (co-creator of Barnaby).*
"Take Us to Your President!"

All geneticists agree that high-energy radiation, including that from fallout radioactivity, causes bad genes. The estimate has been made that so long as testing continues at the present rate the gonads of a human being will receive an exposure of about 0.1 roentgen from fallout radioactivity during a period of 30 years (the average age of parents when a child is born is thirty). This estimate was published in 1956 in the report of the National Academy of Sciences—National Research Council Committee on Biological Effects of Atomic Radiation. Dr. W. F. Libby, the physical chemist who is one of the commissioners of the U. S. Atomic Energy Commission, agrees; he has given 0.03 to 0.15 roentgen as his limits of the value.

During the first 30 years of life the gonads of a young man or woman receive about 3 roentgen of exposure from natural sources — cosmic rays and natural radioactivity. This exposure is unavoidable. It is the cause in part of the mutations that produce the bad genes in the pool of human germ plasm.

If mutations were produced only by radiation, the fallout radiation would cause about a 3-percent increase in the mutation rate. If, however, as most geneticists believe, only a fraction of the natural mutations are due to radiation, the fallout radiation will produce a correspondingly smaller increase. The geneticists of the NAS-NRC committee estimated variously that the amount of exposure that would double the mutation rate is somewhere between 3 roentgen and 180 roentgen. If 180 roentgen were right, the fallout effect would amount to only 0.05 percent increase in mutation rate. Drs. Teller and Latter give the value 0.1 percent, very close to the minimum estimate. I myself estimate 1 percent, 10 times as much. The true value might be somewhat larger than my estimate, or perhaps smaller.

If testing were to be continued indefinitely and the number of mutant genes being produced were accordingly to be increased by 1 percent, a steady state would ultimately be set up in which the number of defective children born would also be increased by 1 percent; that is, 15,000 additional seriously defective children would be born each year. The birth of a seriously defective child is calamity for the parents and for the child himself. The birth of 15,000 additional

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. . . Recent Life Magazine Article on "The Compelling Need for Nuclear Tests"

defective children per year would not endanger the human race; but it is our moral duty to strive to prevent even such a minor increase in the amount of human suffering.

Let us assume that testing of nuclear weapons is continued at the present rate for another 24 years, and then stopped. This would give a total period of 30 years of intensive testing. The number of seriously defective children that would be caused to be born as a result of the fallout mutations when then be 30 x 15,000 or 450,000, according to my estimate. Estimates of others, such as Professor James F. Crow, are similar.

The present rate of testing amounts to about 10 megatons of fission per year. This is the amount of fission that is involved in the explosion of a large superbomb, such as that exploded by the United States on 1 March 1954. We may say, then, that the testing of a single large superbomb is done at the sacrifice of somewhere around 15,000 children.

The Damage to the Living

Geneticists agree rather well in their estimates of genetic damage, but there is less agreement as to the magnitude of the somatic damage, damage to the health of human beings now living, as a result of fallout radioactivity. There is no doubt that fallout radioactivity, like other atomic radiation, produces leukemia, bone cancer, and other diseases, and causes a significant shortening in life, when the exposure is large. The question at issue is whether a small amount of radiation, 100 times smaller, has a 100 times smaller chance of producing leukemia and other diseases, or whether it is harmless. The evidence on this point is far from convincing. Some scientists say that they feel that small amounts of radiation do not do any harm at all. Other scientists, of whom I am one, think that it is highly probable that a small amount of radiation has a correspondingly small, but not zero, chance of causing leukemia and other diseases. The reason for this belief is that it is known that some of these diseases involve changes in the chromosomes, which also are involved in genetic mutations, and it seems accordingly probable that the little bullets of high-energy radiation have a somatic effect similar to the genetic effect. In any case, many scientists have pointed out that so long as the question is undecided we would be wise to assume that somatic damage is done.

Radiation causes a decrease in life expectancy in human beings that has been estimated in various ways to be about 10 days per roentgen. The average fallout exposure of 0.1 roentgen in 30 years would correspond to about 0.2 roentgen in a lifetime, and hence to an average decrease in life expectancy of 2 days. Drs. Teller and Latter say that the reduction in life expectancy from world-wide fallout at present levels totals less than 2 days. (They also say that if tests continue at the present rate, radiation levels might increase as much as five-fold, which suggests that the decrease in life expectancy might ultimately become greater.)

The Decrease in Life Expectancy

A decrease of 2 days in life expectancy might be considered negligible. Drs. Teller and Latter point out that a wrist watch with radioactive dial, gives radiation exposure comparable to that of fallout, that a life-long habit of smoking one pack of cigarettes per day cuts down life expectancy by 7 years, and that there are other factors associated with life in the modern world that decrease life expectancy. I might say that very few people in the world wear wrist watches with radioactive dials, and there probably will be fewer in the future, and also it is only for the cigarette smoker that life expectancy is cut down by the smoking of cigarettes, and that a cigarette smoker is a man who is willing to take the chance of dying of lung cancer—I myself do not smoke. But I, like everybody else in the world now, am being subjected to damage by fallout radioactivity, damage that may cause me to die from leukemia next year.

A decrease of 2 days in life expectancy might not be considered a serious matter if it meant that every person would die 2 days earlier than otherwise. But let us consider what death by leukemia or bone cancer or other disease means.

One of the people of a group of 2500 may happen to have the bad luck of having one of his molecules damaged by fallout radiation in such a way as to cause him to die of leukemia or other disease, and the other 2499 might not be harmed at all by the fallout radiation. The first man may die 5000 days before he would have died if the bomb tests had not been made; his life expectancy will have been shortened by 10,000 days, or 14 years, and the other 2499 not shortened at all. This amounts to an average decrease in life expectancy of 2 days per person. There are 2500 million people in the world, and accordingly we may conclude that, if testing is continued, it may cause 1 million people now living in the world to die 10 or 15 or 20 years earlier than they would have if the bomb tests had not been carried out. We may say that we would be sacrificing 1 million people of the present generation to the bomb tests, if they were to be continued for another 24 years, about 200,000 to the tests already made.

Let us convert this figure to an annual basis. If we take 60 years as the mean life expectancy of people in the world (this corresponds to our taking 0.2 roentgen as the mean exposure), we find that the number of people who will die 10 or 15 or 20 years earlier because of damage done by bomb tests is about 15,000 per year. The present rate of testing, 10 megatons of fission per year, corresponds to the testing of a single large superbomb each year. We may accordingly say that the testing of a single large superbomb involves the estimated sacrifice of about 15,000 children, who will be caused to be born with serious defects, and about 15,000 other human beings, who suffer somatic damage from the fallout radioactivity.

If These Were Bullets

It has been pointed out from time to time that if the bullets of radioactivity were not so tiny that their effects could not be noticed, and if the nature of the damage were not such that no individual defective child or individual sufferer from leukemia or bone cancer can be pointed out as having suffered from damage by fallout radioactivity rather than background radiation or some other cause, but instead were large bullets, which caused the immediate and unmistakable death of 15,000 or even 1000 human beings when a bomb test is carried out, public opinion would be aroused in so vigorous a way that the bomb tests would soon be stopped. Can it be that we are so lacking in imagination and in the ability of abstract thought as to continue to carry out the tests of great bombs?

Dr. Teller argues in support of continuing nuclear tests because he believes in war, in nuclear war. He is working for a future in which world problems are settled by nuclear wars, fought in such a way (he hopes) that the terrible weapons kill great numbers of young men in the armies, and only a few civilians (only a few million).

I believe that war is immoral, and must be eliminated. I believe that there will never be a great nuclear war. I believe that the present stockpiles of nuclear weapons, powerful enough to destroy the world, really are deterrents, as our great national leaders say. But if they are deterrents —if they prevent war—then they do not solve the world problems. These problems must be solved in another way —by long-continued negotiation, arbitration, development of an effective system of international law, and at first by international agreements that are acceptable to all nations and that benefit all nations and all people. My 9234 fellow scientists and I (with Drs. Teller and Latter objecting) propose that we begin the new era of peace and international law by making an agreement to stop bomb tests.

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Some Pointers Which Show Washington's Indifference or Hostility to Exploratory Talks

The Home-Made Gremlins Which Haunt Our Ambassador in Moscow

The President's latest letter to Bulganin says quite correctly that "exchanges of views effected through our Ambassadors" are preferable to polemics in preparing for a summit meeting. But it is disturbing to notice that Ambassador Thompson, returning to Moscow after two weeks of consultations here, "brought no instructions to sound out Kremlin thinking" (dispatch from Moscow, *N. Y. Times,* Feb. 14). Three days earlier Mr. Dulles at press conference also said in answer to a question about the Ambassador, "He has no present instructions, no." One get the impression that Washington is in no hurry about exploratory talks.

Glorified Messenger Boys

The absence of instructions must be evaluated in the framework of the realities within which the Ambassador must operate. A sketch of him in the *New York Times* Sunday magazine of January 26 hinted at his difficulties. It said that as an old hand at dealing with the Russians, Mr. Thompson believed the way to get results was "through informal unpublicized talks." But in recent years, the article said, Ambassadors "have tended to become expensive messenger services for the Secretary of State" and that "more and more decisions on even comparatively minor matters are taken in Washington and relayed to the field." This is the same kind of rigid overcentralization of which Western diplomats justifiably complain in dealing with the Soviet Foreign Service.

At times Washington seems deliberately to make our Ambassador's task more difficult. Much is said of the need for talks without publicity. But when the Ambassador on the eve of his return had a talk January 23 with Foreign Minister Gromyko, it was disclosed the very next day at a press conference in Washington and pictured as discouraging. "When a reporter noted," said the *New York Times* account (Jan. 25), "that it was most unusual for the State Department to disclose the content of such diplomatic discussions," the spokesman explained this was done in deference to the wide interest in the prospects for a summit meeting. The Department is rarely so deferential to public curiosity.

This unusual press conference seems to have disturbed our Embassy in Moscow, too. The day after the conference a cable from Moscow (see p. 2 *New York Times* Jan. 26) said Gromyko's response had been "neither discouraging nor encouraging," reported that Ambassador Thompson thought the best way to make progress was by talks "outside the glare of publicity and propaganda" but added significantly, "Some persons in Washington apparently have not been convinced of the advantage of that approach." Or are not particularly interested in its success.

What A Little Error Could Do

"American commanders throughout the world are empowered to reply when their units are menaced. One may presume the same is true for Soviet commanders. In this era of cold war, is it not possible for human error to creep in . . . ? We know already of two tense moments when we thought Soviet aerial armadas were on the offensive—one toward the United States, once over Turkey. Both were false alarms."

—C. L. Sulzberger, New York Times, Feb. 15

"A sizeable number of SAC's bombers are always on the alert . . . and in 15 minutes scores of B-47's and B-52's can be . . . on their way toward Russia. Such emergency take-offs actually have been made when radar screens indicated (falsely) large numbers of unidentified planes approaching our bases. . . .

"Our reaction time [when missiles come into service] will then be still further reduced, and the defense will be confronted with a terrible question. Are those blips on the radar screen moving toward our shores the real thing? Is the enemy attacking—or are the blips as they have been so often in the past, merely electronic 'ghosts', mysterious phenomena that clutter up the radar screen with false alarms? . . . Recall—once the missile is launched—is impossible. . . .

"Col. Harvey W. Shelton put the problem in sharp perspective in an article in last summer's issue of the Air University Quarterly Review: . . . 'Imagine a two-way intercontinental exchange of ballistic missile forces that was triggered off by one radar which could not tell the difference between a meteorite and an ICBM."

—Hanson W. Baldwin, New York Times, Feb. 4.

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